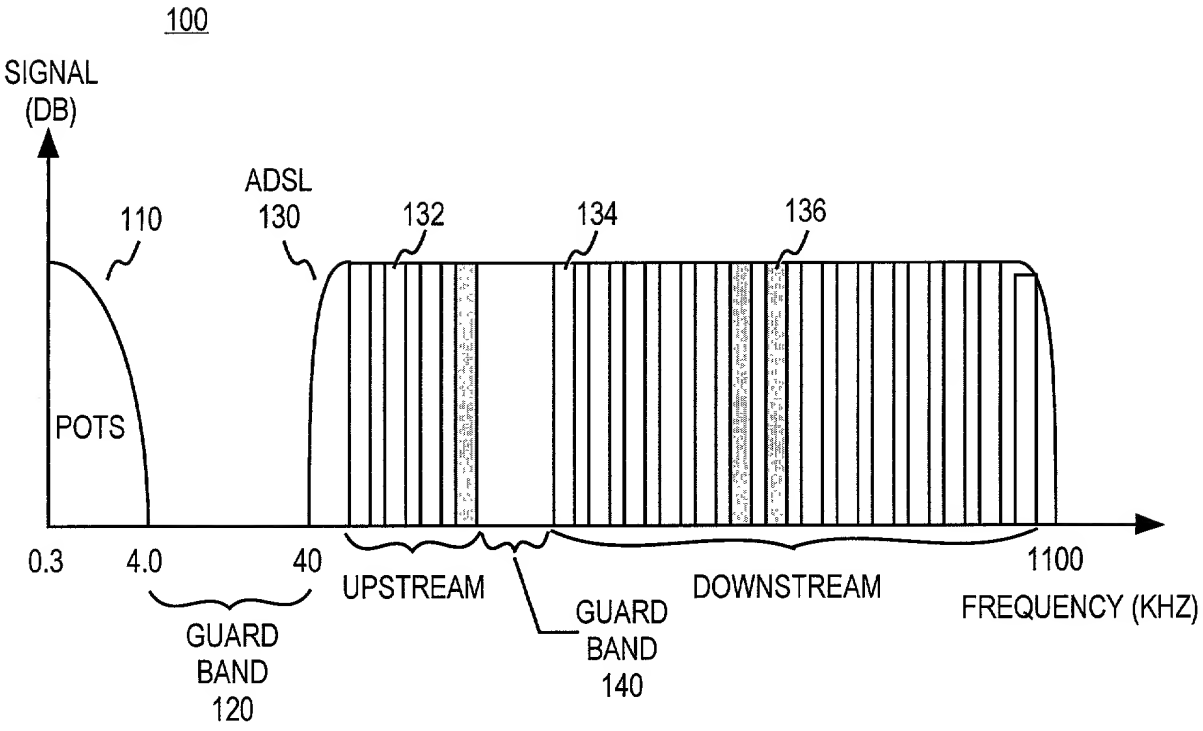
100
SIGNAL
(DB)
110
ADSL
130
132
134
136
POTS
0.3
4.0
40
UPSTREAM
GUARD
BAND
140
DOWNSTREAM
1100
FREQUENCY (KHZ)
GUARD
BAND
120

FIG. 1

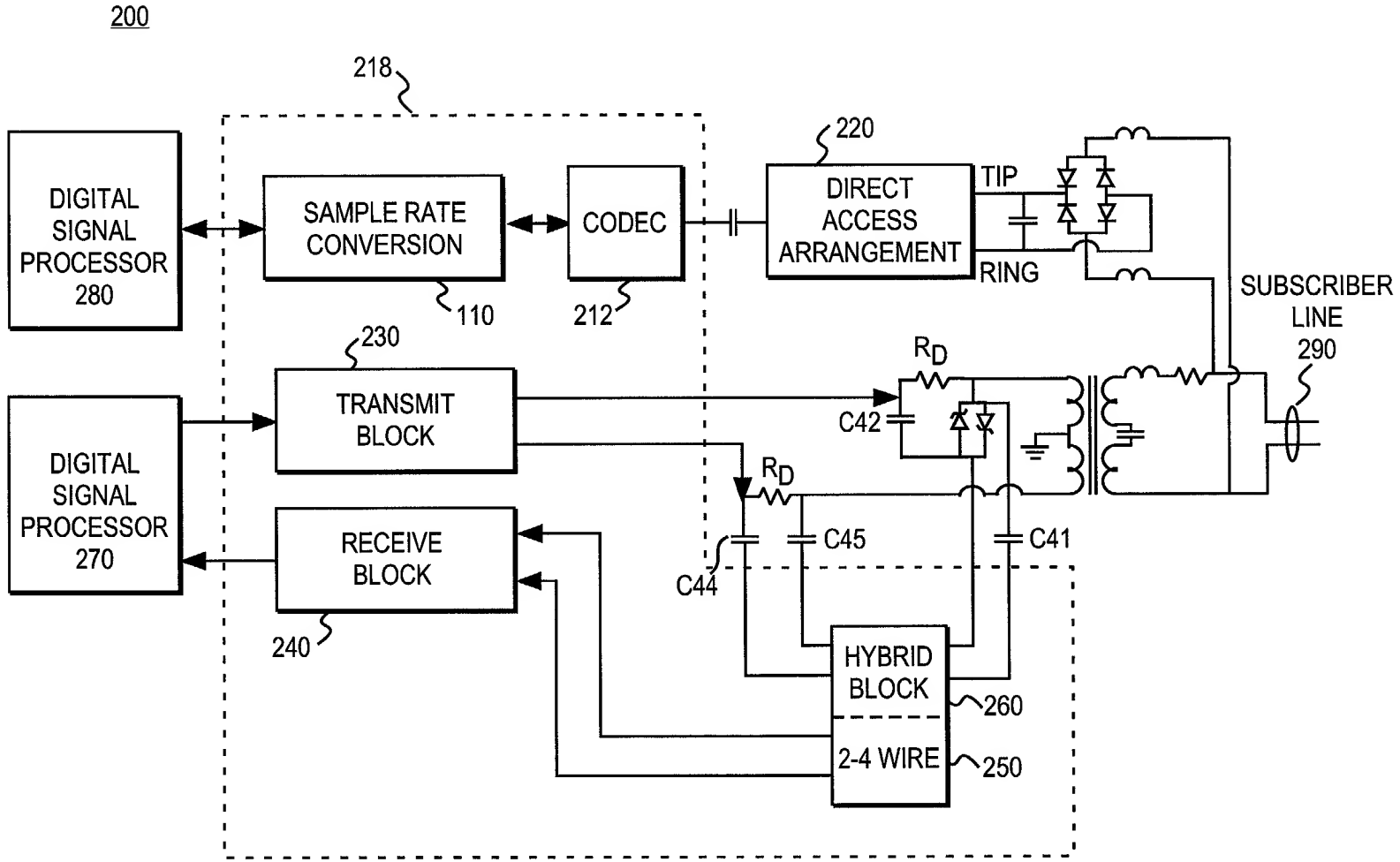

FIG. 2

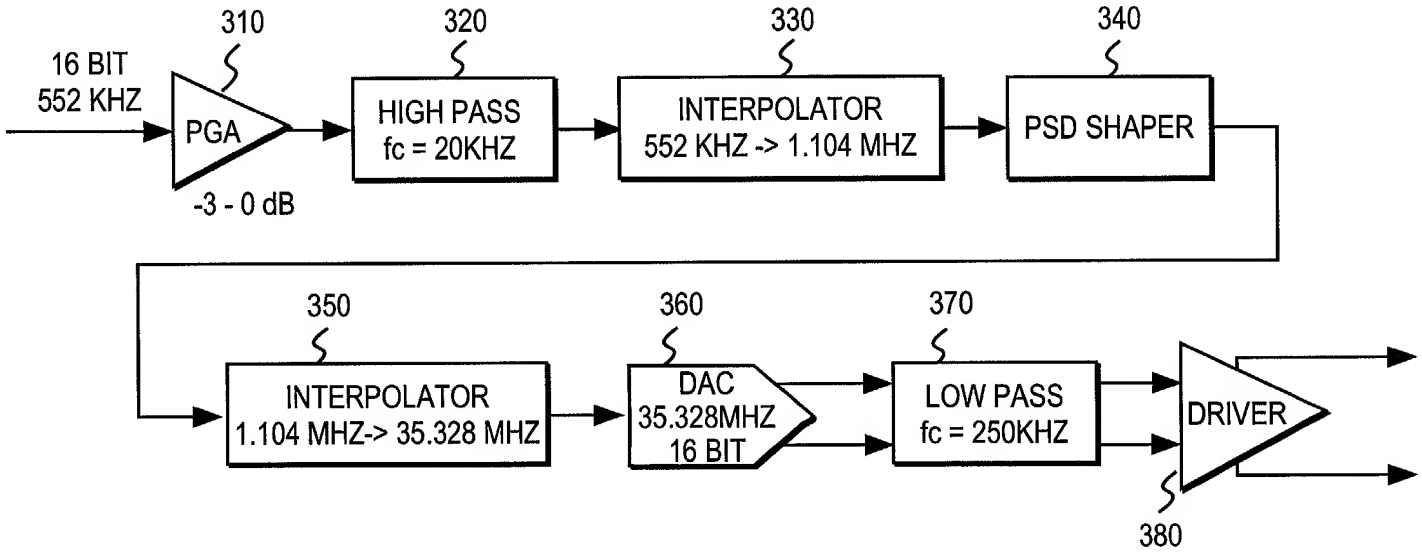
16 BIT
552 KHZ
310
PGA
-3 - 0 dB
320
HIGH PASS
fc = 20KHZ
330
INTERPOLATOR
552 KHZ -> 1.104 MHZ
340
PSD SHAPER
350
INTERPOLATOR
1.104 MHZ-> 35.328 MHZ
360
DAC
35.328MHZ
16 BIT
370
LOW PASS
fc = 250KHZ
DRIVER
380

FIG. 3

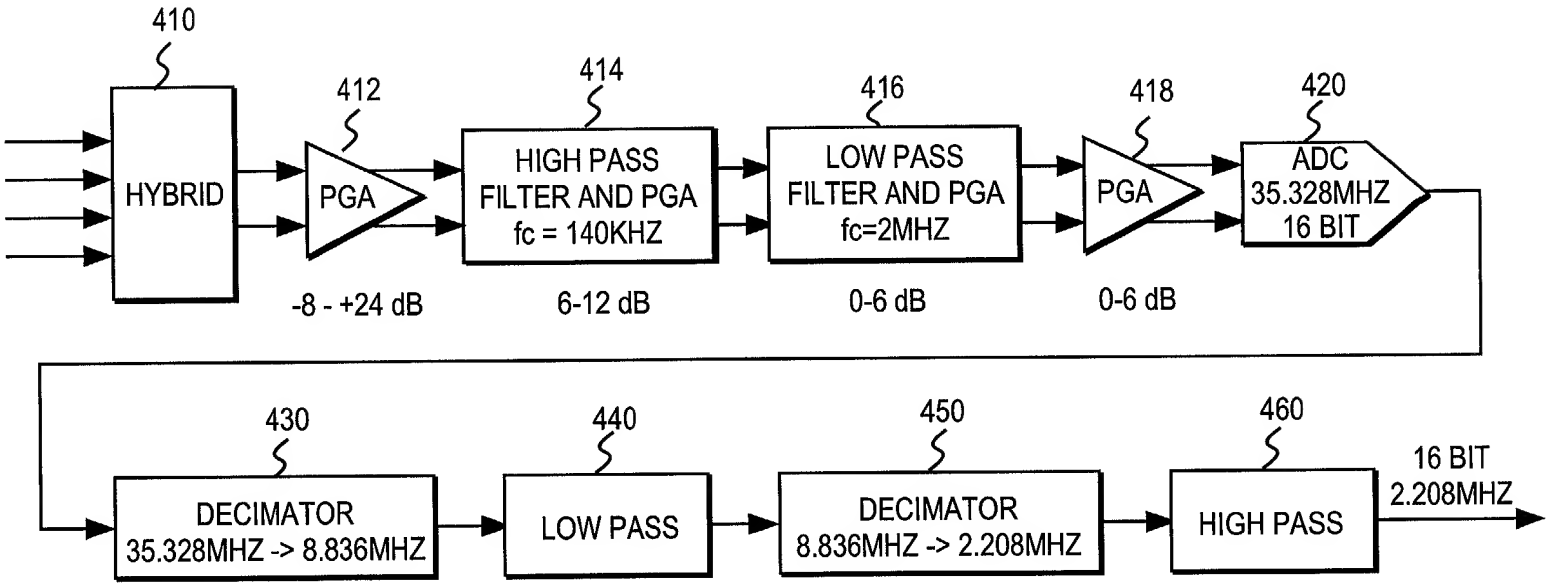
410
HYBRID
412
PGA
-8 - +24 dB
414
HIGH PASS
FILTER AND PGA
fc = 140KHZ
6-12 dB
416
LOW PASS
FILTER AND PGA
fc=2MHZ
0-6 dB
418
PGA
0-6 dB
420
ADC
35.328MHZ
16 BIT
430
DECIMATOR
35.328MHZ -> 8.836MHZ
440
LOW PASS
450
DECIMATOR
8.836MHZ -> 2.208MHZ
460
HIGH PASS
16 BIT
2.208MHZ

FIG. 4

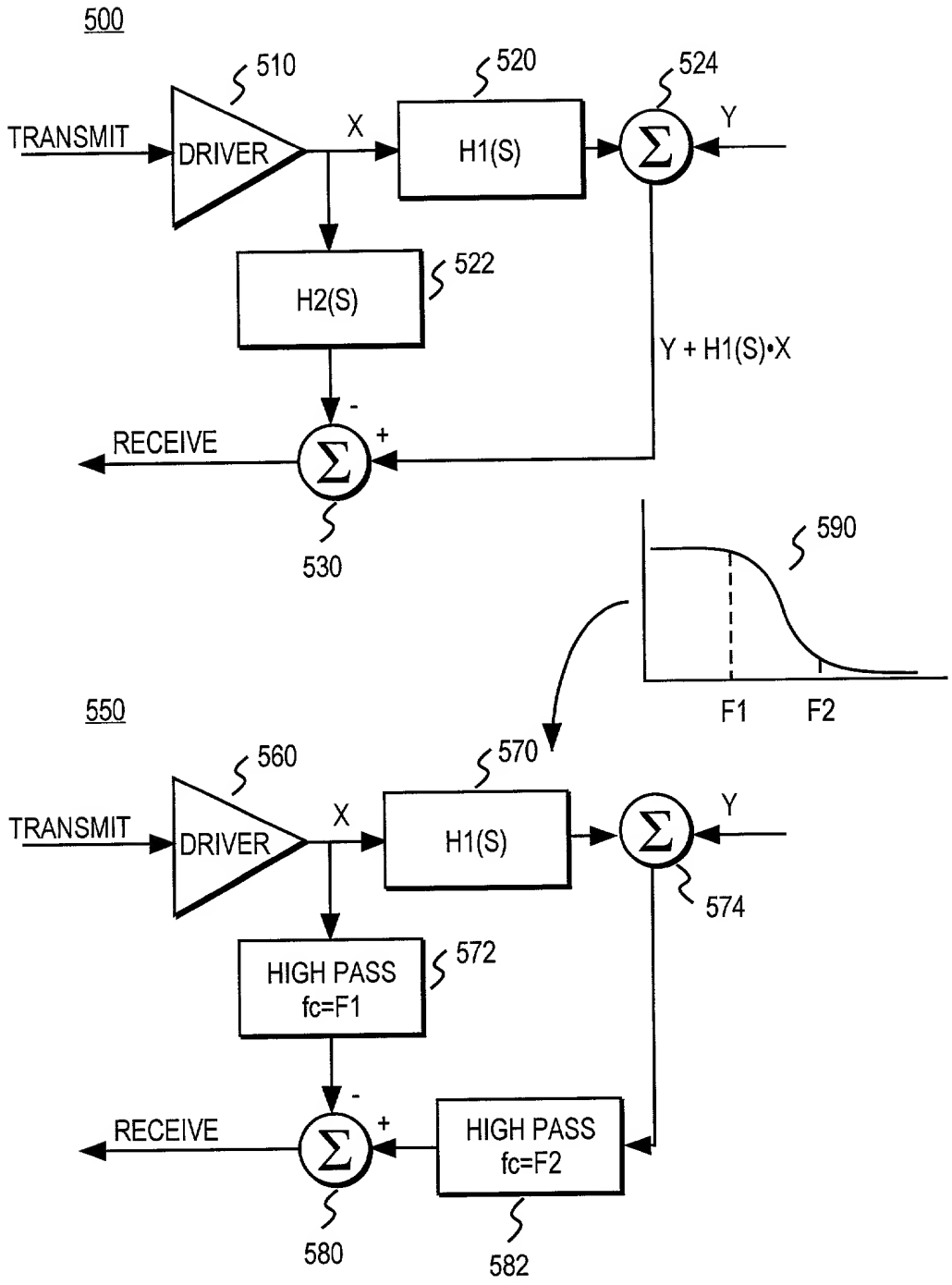
500
510
520
524
TRANSMIT
DRIVER
X
H1(S)
Y
H2(S)
522
Y + H1(S)•X
RECEIVE
-
+
530
590
F1
F2
550
560
570
TRANSMIT
DRIVER
X
H1(S)
Y
574
HIGH PASS
fc=F1
572
RECEIVE
-
+
HIGH PASS
fc=F2
580
582

FIG. 5

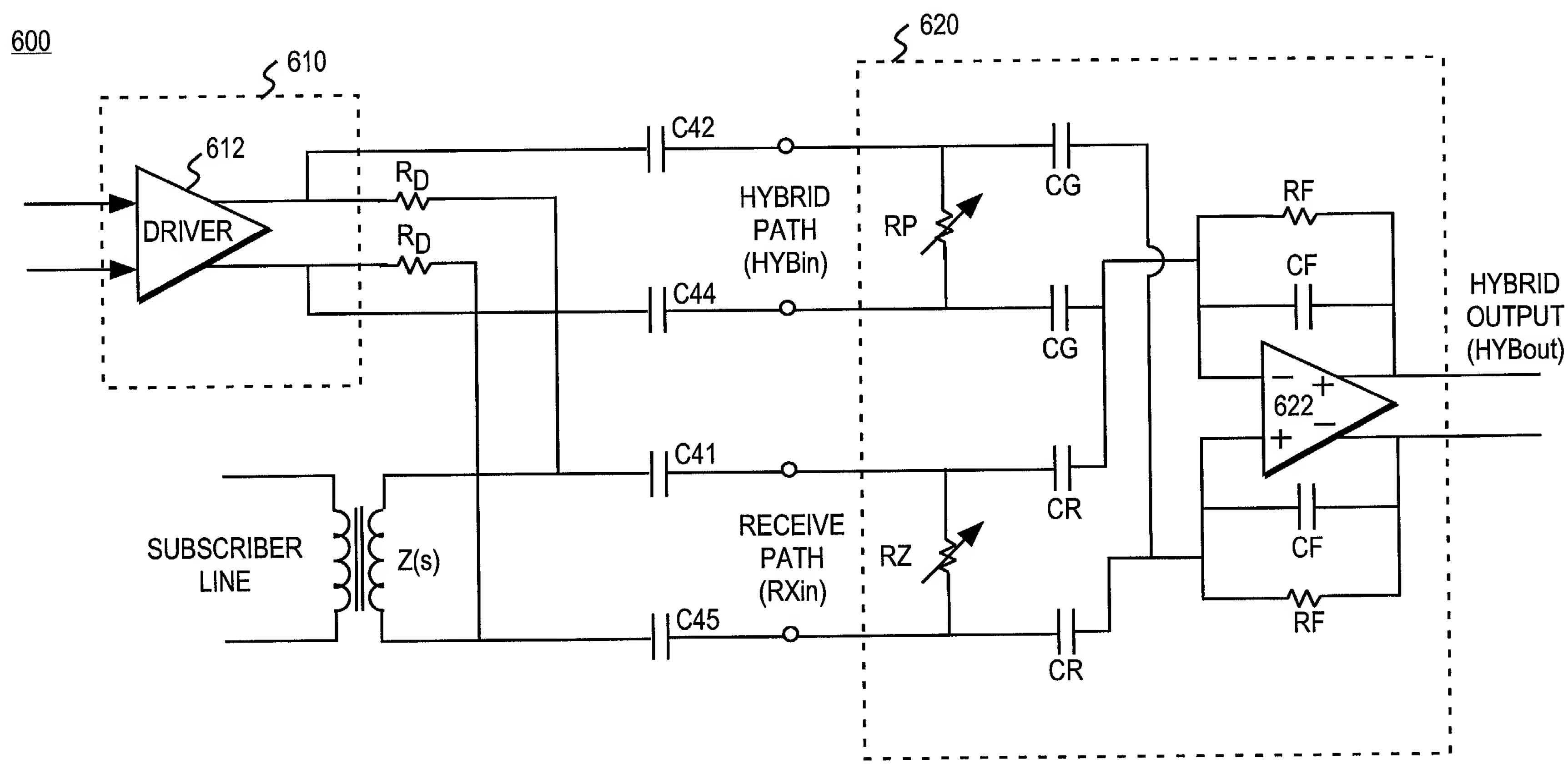
600
610
612
DRIVER
R_D
R_D
C42
C44
C41
C45
HYBRID
PATH
(HYBin)
RECEIVE
PATH
(RXin)
SUBSCRIBER
LINE
Z(s)
620
RP
RZ
CG
CG
CR
CR
RF
CF
622
CF
RF
HYBRID
OUTPUT
(HYBout)

FIG. 6

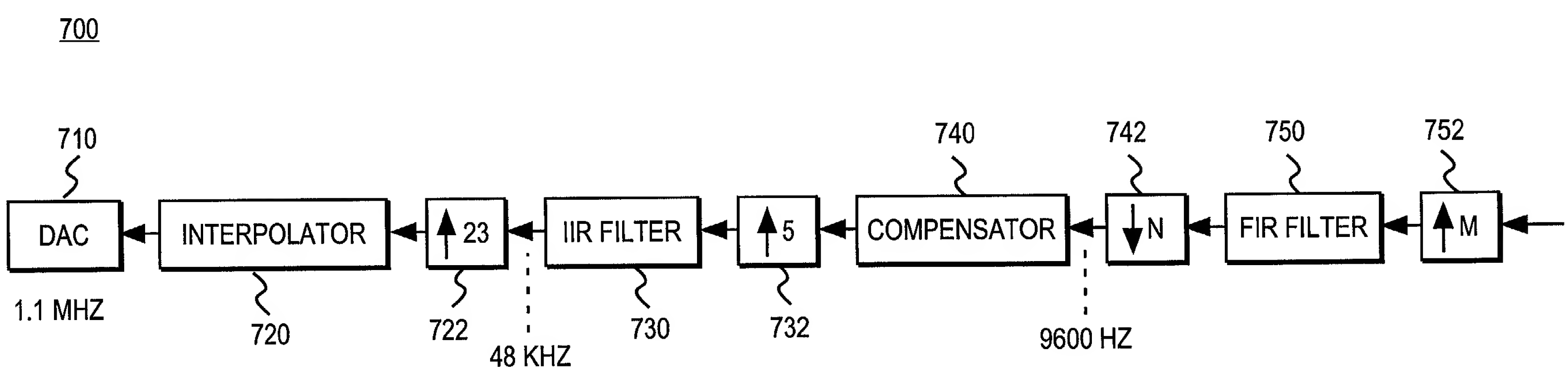
700
710
DAC
1.1 MHZ
INTERPOLATOR
720
23
722
48 KHZ
IIR FILTER
730
5
732
COMPENSATOR
740
9600 HZ
N
742
FIR FILTER
750
M
752

FIG. 7

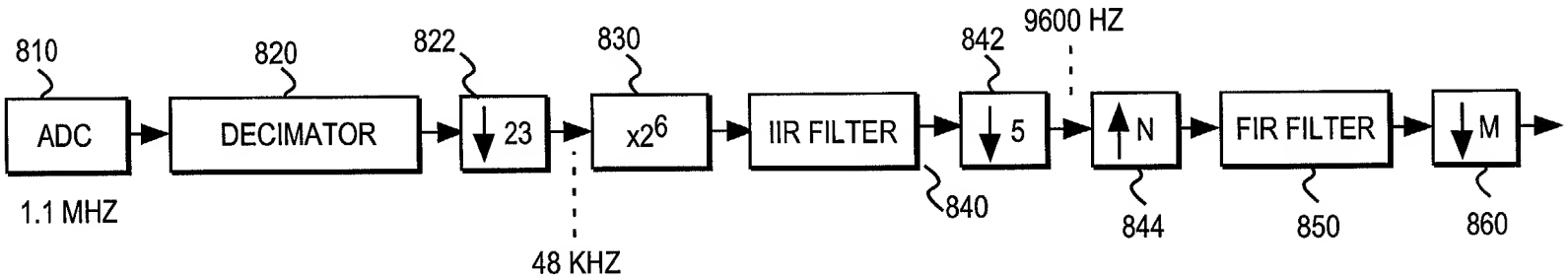
810
820
822
830
842
9600 HZ
ADC
DECIMATOR
23
x2^6
IIR FILTER
5
N
FIR FILTER
M
1.1 MHZ
48 KHZ
840
844
850
860

FIG. 8

900

	A->D			D->A	
f_i	M/N	OPT M/N	f_{audio}	N/M	N/M•f_{audio}
7200	8/6	16/12	9600	12/16	7200
8000	6/5	6/5	9600	5/6	8000
8229	7/6	14/12	9600	12/14	8228.57
8400	8/7	16/14	9600	14/16	8400
9000	16/15	16/15	9000	15/16	9000
9600	1/1	16/16	9600	16/16	9600
10,286	14/15	14/15	9600	15/14	10,285.71

FIG. 9

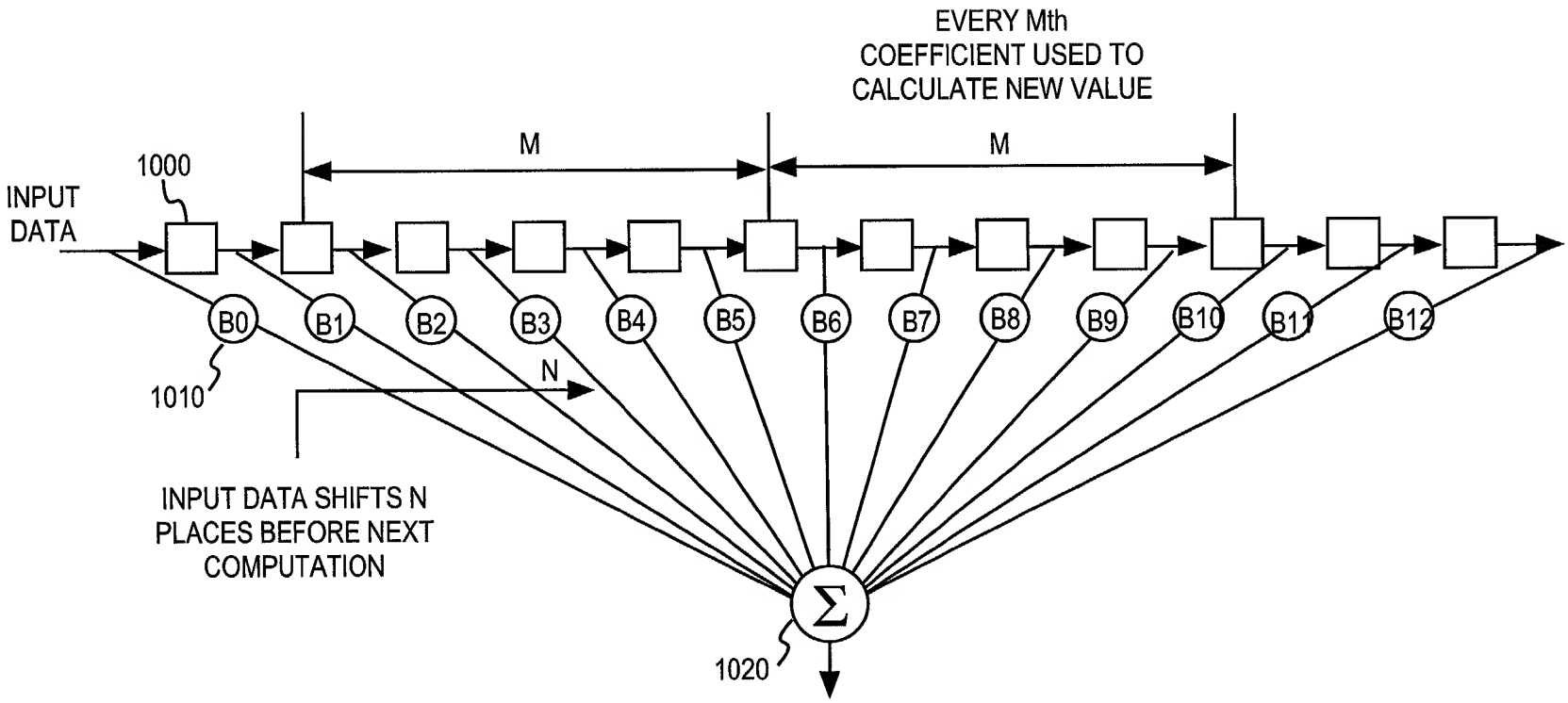
EVERY Mth
COEFFICIENT USED TO
CALCULATE NEW VALUE
M
M
1000
INPUT
DATA
B0
B1
B2
B3
B4
B5
B6
B7
B8
B9
B10
B11
B12
1010
N
INPUT DATA SHIFTS N
PLACES BEFORE NEXT
COMPUTATION
Σ
1020

FIG. 10

1100

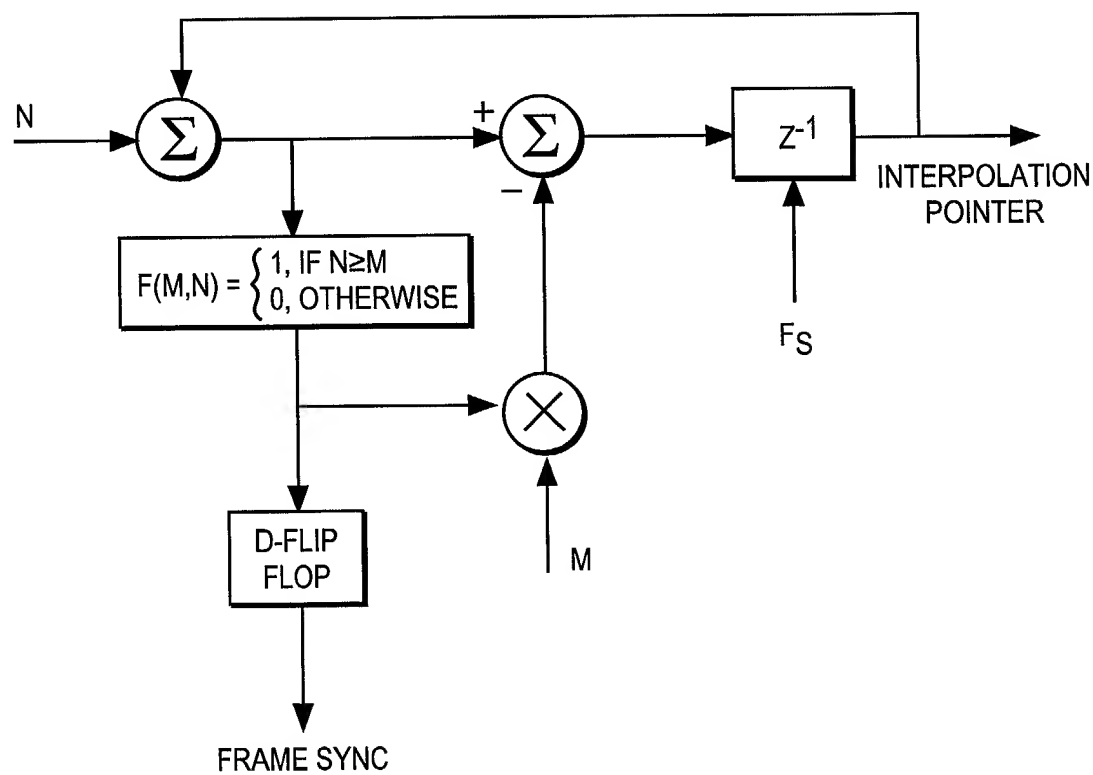
N
+
−
Z^{-1}
INTERPOLATION POINTER
F(M,N) = { 1, IF N≥M; 0, OTHERWISE
F_S
D-FLIP FLOP
M
FRAME SYNC

FIG. 11

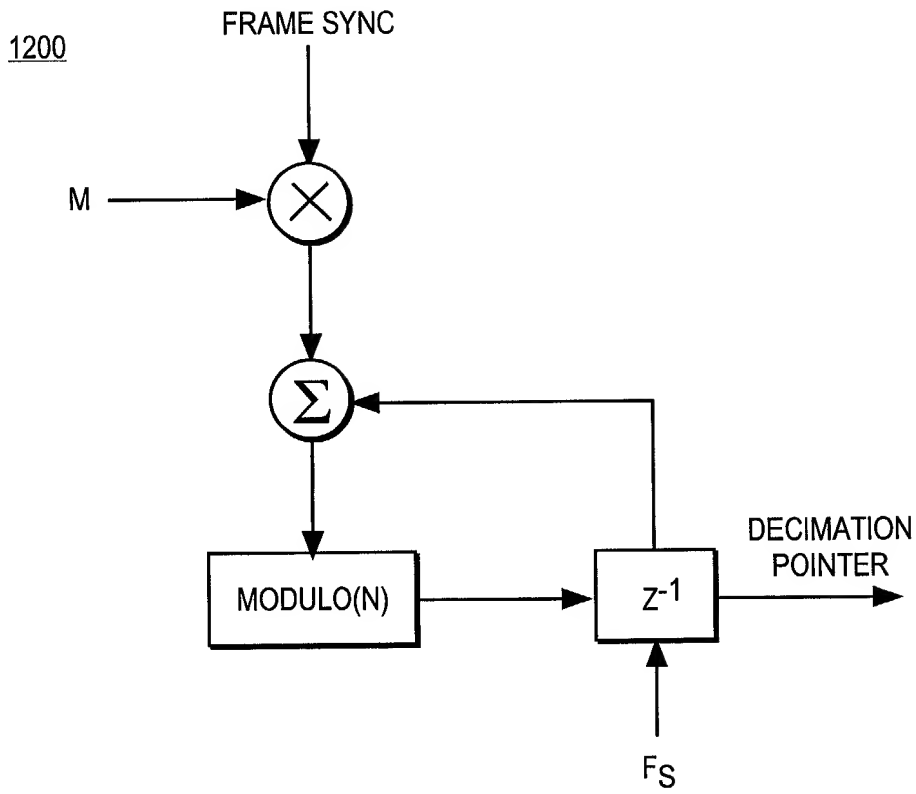

FIG. 12